

# **National Grid SA-CO** **PRODUCTION FILE**

**Contractor : ABB Contracting Co.**

**Project : SS 8709- 132/13.8kV in Alkha**

**Contract No : 11131113/00**

**Substation : 8709**

**Subject : 132kV FOIP Panel (+FOIP)**

**ABB**

A



POWER SYSTEMS NETWORK MANAGEMENT  
PROTECTION AND SUBSTATION AUTOMATION SYSTEMS  
WBS NO: S-13656

ABB AUTOMATION COMPANY LTD  
414, AL-KHARJ ROAD  
SECOND INDUSTRIAL CITY  
RIYADH-11383 K.S.A

B

C

CONTRACTOR : ABB Contracting Company  
CLIENT : National Gridsa  
PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY  
SUBSTATION : S/S 8709  
CONTRACT NO. : 11131113/00  
TITLE : ASSEMBLY DRAWINGS +FOIP - 132KV



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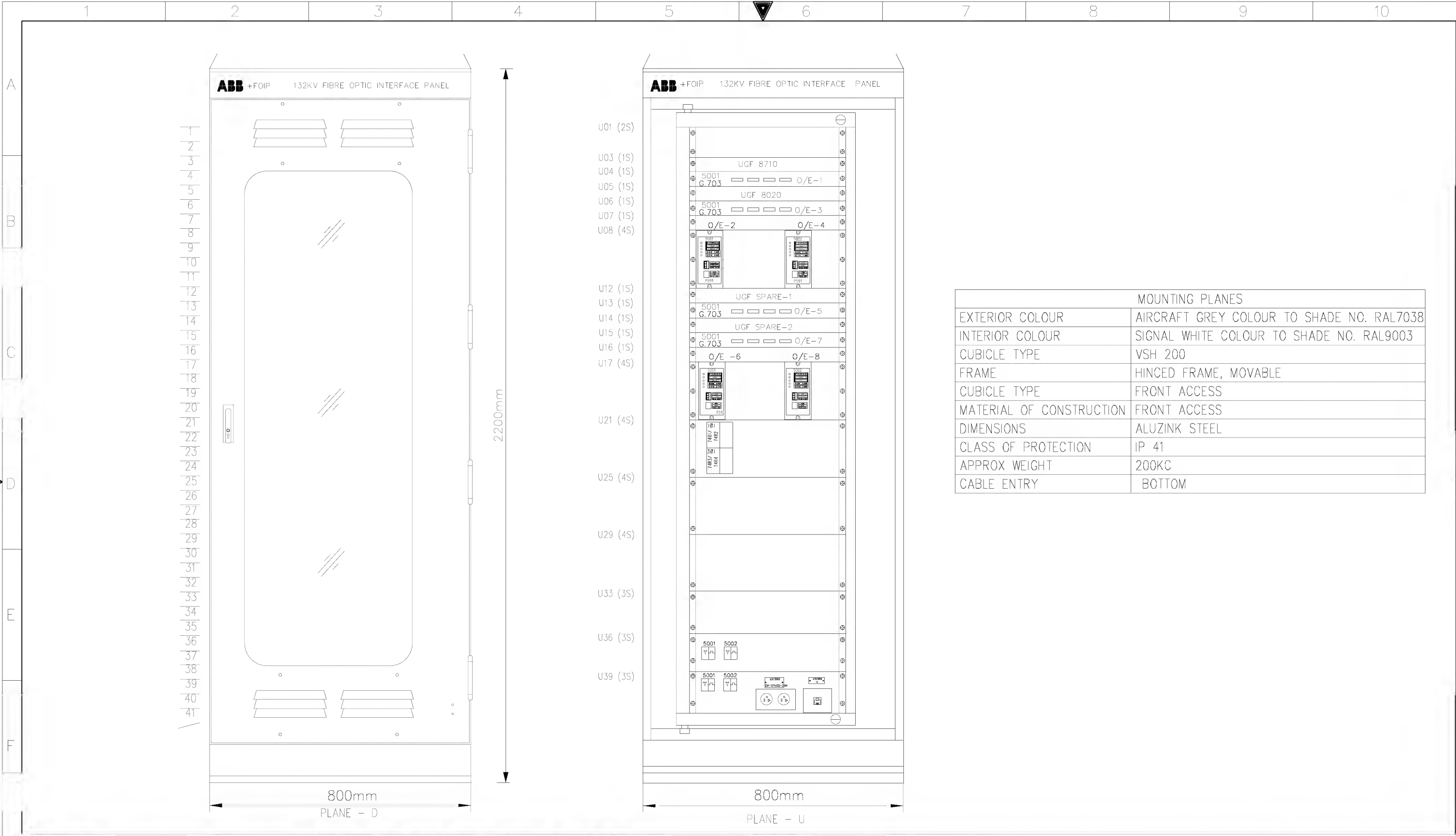
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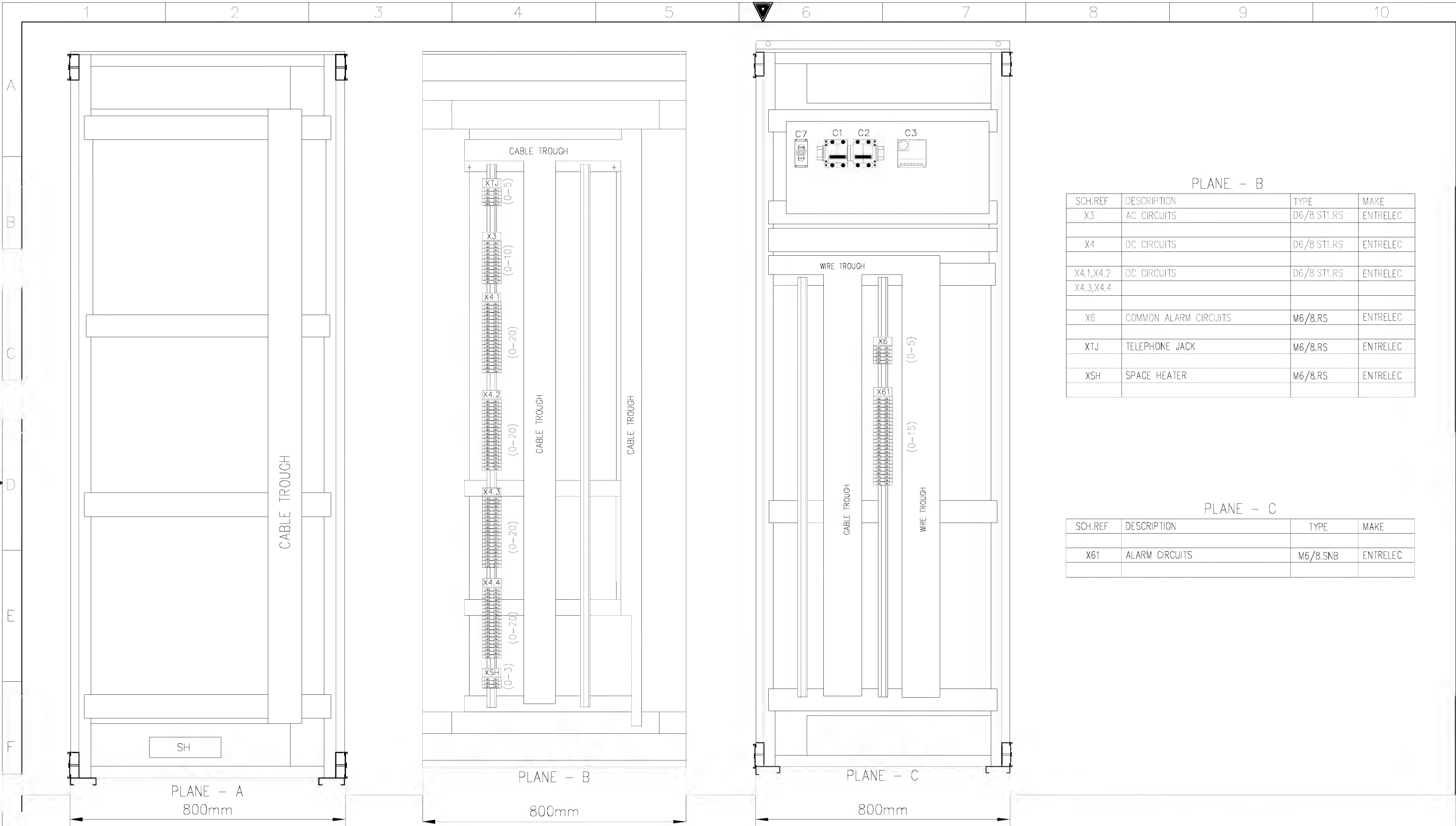
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AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		COVER SHEET			<div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div>					
01	13 49	FACTORY ASBUILT	DRAWN BY RIZ			CHECKED BY KVR			132kV FIBER OPTIC PANEL +FOIP						
00	13 04	FOR APPROVAL	DATE STARTED 24.01.2013			DATE COMPLETED _____			S/S 8709 - 132/13.8KV IN AL-KHARJ CITY						
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD			ENG. DEPT. AUT-PSAC			RIYADH SAUDI ARABIA						
									INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.
									-	C421	CD-323011		SHT	CONT.	01
											G00G01				







G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		ASSEMBLY DRAWING		الشركة الوطنية لنقل الكهرباء		 نقل الكهرباء National Grid sa				
	01	13 49	FACTORY ASBUILT FOR APPROVAL		DRAWN BY RIZ CHECKED BY KVR		132kv FIBER OPTIC PANEL +FOIP		INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.
	00	13 04			DATE STARTED 24.01.2013 DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY						SHT	CONT.	
	REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA		-	C421	CD-323011		G01	G02	01	





PLANE - B			
SCH.REF	DESCRIPTION	TYPE	MAKE
X3	AC CIRCUITS	D6/8 ST1.RS	ENTRELEC
X4	DC CIRCUITS	D6/8 ST1.RS	ENTRELEC
X4.1,X4.2 X4.3,X4.4	DC CIRCUITS	D6/8 ST1.RS	ENTRELEC
X6	COMMON ALARM CIRCUITS	M6/8.RS	ENTRELEC
XTJ	TELEPHONE JACK	M6/8.RS	ENTRELEC
XSH	SPACE HEATER	M6/8.RS	ENTRELEC

PLANE - C			
SCH.REF	DESCRIPTION	TYPE	MAKE
X61	ALARM CIRCUITS	M6/8.SNB	ENTRELEC

G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		ASSEMBLY DRAWING		<div>الشركة الوطنية لنقل الكهرباء</div> <div> <b>نقل الكهرباء</b> National Grid sa</div>								
				DRAWN BY <u>RIZ</u>	CHECKED BY <u>KVR</u>	132kV FIBER OPTIC PANEL +FOIP				INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.	
	01	13 49	FACTORY ASBUILT	DATE STARTED <u>24.01.2013</u>		DATE COMPLETED _____	S/S 8709 - 132/13.8KV IN AL-KHARJ CITY				-	C421	CD-323011		SHT	CONT.	01
	00	13 04	FOR APPROVAL	OPRG. DEPT. <u>CTPD</u>		ENG. DEPT. <u>AUT-PSAC</u>	RIYADH SAUDI ARABIA								G02	L00	
	REV. NO.	DATE	DESCRIPTION														

	1	2	3	4	5	6	7	8	9	10
A			POWER SYSTEMS NETWORK MANAGEMENT PROTECTION AND SUBSTATION AUTOMATION SYSTEMS WBS NO: S-13656					ABB AUTOMATION COMPANY LTD 414, AL-KHARJ ROAD SECOND INDUSTRIAL CITY RIYADH-11383 K.S.A		
B										
C										
D	CONTRACTOR : ABB Contracting Company									
	CLIENT : National Gridsa									
	PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY									
	SUBSTATION : S/S 8709									
E	CONTRACT NO. : 11131113/00									
F	TITLE : LIST OF APPARATUS +FOIP - 132KV									


G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00	JOB ORDER NO. S-13656	COVER SHEET		 <b>نقل الكهرباء</b> الشركة الوطنية لنقل الكهرباء National Grid sa			
	01	13 49	FACTORY ASBUILT	DRAWN BY RIZ	CHECKED BY KVR	132kV FIBER OPTIC PANEL +FOIP				
	00	13 04	FOR APPROVAL	DATE STARTED 24.01.2013	DATE COMPLETED _____	S/S 8709 - 132/13.8KV IN AL-KHARJ CITY	INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.
	REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD	ENG. DEPT. AUT-PSAC	RIYADH SAUDI ARABIA	-	C421	CD-323011	REV. NO. 01


	1	2	3	4	5	6	7	8	9	10							
A	SR. NO.	GA. REF.	SCH. REF.	D E S C R I P T I O N		SH.NO	QTY.	TYPE	MAKE	ORDERING INFORMATION	ORIGIN OF COUNTRY						
B	1	U04.5001	O/E-1	OPTICAL/ELECTRICAL CONVERTER FOR SHORT RANGE		221	4	C37.94 TO G703 E1	FIBER SYSTEM	1 MRK 002 245-BA	SWEDEN						
		U06.5001	O/E-3	FIBRE OPTICAL MODULE X.21/G703, DATA SPEED : 2.048 MBITS/S		223											
		U13.5001	O/E-5	POWER SUPPLY : 48V DC TO 250V DC;		225											
		U15.5001	O/E-7	POWER SUPPLY : 110V AC TO 230V AC		227											
				WAVE LENGTH : 820nm;													
				OPTICAL CONNECTOR : ST;													
				TYPICAL DISTANCE : 2KM													
C				OPTICAL SYSTEM BUDJECT : 13db WITH MULTIMODE FIBER (625/122Hm)													
				OPTICAL SYSTEM BUDJECT : 99db WITH MULTIMODE FIBER (50/125Hm)													
	2	U08.5001	O/E-2	OPTICAL/ELECTRICAL CONVERTER FOR SHORT RANGE		222	4	P591	ALSTOM	P591602A0M0200B	UK						
		U08.5002	O/E-4	FIBRE OPTICAL MODULE P591		224											
				POWER SUPPLY : 48V DC TO 250V DC;		226											
D				POWER SUPPLY : 110V AC TO 230V AC		228											
				DATA SPEED : 2.048 MBITS/S;													
		U17.5001	O/E-6	WAVE LENGTH : 820nm;													
		U17.5002	O/E-8	OPTICAL CONNECTOR : ST													
				TYPICAL DISTANCE : 2KM													
				OPTICAL SYSTEM BUDJECT : 13db WITH MULTIMODE FIBER (625/122Hm)													
				OPTICAL SYSTEM BUDJECT :99db WITH MULTIMODE FIBER (50/125Hm)													
E	3	U21.101	74R1/74R2,	DUAL COIL RELAY FOR 74R1/74R2 & 74R3/74R4													
		U21.301	74R3/74R4	DC SUPERVISION		235		RXSF1	ABB	RK 271 019-AN	SWEDEN						
				AUXILIARY VOLTAGE : 110-125VDC													
				CONTACT DATA : 1NO + 2NC PER COIL													
				FLAG : SELF RESET													
F																	
G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		LIST OF APPARATUS		<div>الشركة الوطنية لنقل الكهرباء</div> <div> نقل الكهرباء National Grid sa</div>								
	01	13 49	FACTORY ASBUILT		DRAWN BY RIZ CHECKED BY KVR		132kV FIBER OPTIC PANEL +FOIP										
	00	13 04	FOR APPROVAL		DATE STARTED 24.01.2013 DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY		INDEX	PLANT NO.	DRAWING NUMBER						
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA		-	C421	CD-323011						
									SHEET NO. REV. NO.								
									SHT	CONT.	01						
									L01	L02							










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A			POWER SYSTEMS NETWORK MANAGEMENT PROTECTION AND SUBSTATION AUTOMATION SYSTEMS WBS NO: S-13656					ABB AUTOMATION COMPANY LTD. 414, AL-KHARJ ROAD SECOND INDUSTRIAL CITY RIYADH-11383 K.S.A		
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D	CONTRACTOR : ABB Contracting Company									
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	SUBSTATION : S/S 8709									
E	CONTRACT NO. : 11131113/00									
F	TITLE : SHEMATIC DRAWINGS +FOIP - 132KV									

G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00	JOB ORDER NO. S-13656	COVER SHEET		 <b>نقل الكهرباء</b> الشركة الوطنية لنقل الكهرباء National Grid sa			
	01	13 49	FACTORY ASBUILT	DRAWN BY RIZ	CHECKED BY KVR	132kV FIBER OPTIC PANEL +FOIP				
	00	13 04	FOR APPROVAL	DATE STARTED 24.01.2013	DATE COMPLETED _____	S/S 8709 - 132/13.8KV IN AL-KHARJ CITY	INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.
	REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPC	ENG. DEPT. AUT-PSAC	RIYADH SAUDI ARABIA	-	C421	CD-323012	000001

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G	<table><tr><td colspan="3">AS-BUILT BY _____ DATE _____</td><td colspan="2">CONTRACT NO. 11131113/00</td><td colspan="2">JOB ORDER NO. S-13656</td><td colspan="3">CONTENTS SHEET</td><td colspan="2"><div>الشركة الوطنية لنقل الكهرباء</div><div> <b>نقل الكهرباء</b> National Grid sa</div></td></tr><tr><td colspan="3">01 13 49 FACTORY ASBUILT</td><td colspan="2">DRAWN BY RIZ</td><td colspan="2">CHECKED BY KVR</td><td colspan="3">132kV FIBER OPTIC PANEL +FOIP</td><td colspan="2">INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO.</td></tr><tr><td colspan="3">00 13 04 FOR APPROVAL</td><td colspan="2">DATE STARTED 24.01.2013</td><td colspan="2">DATE COMPLETED</td><td colspan="3">S/S 8709 - 132/13.8KV IN AL-KHARJ CITY</td><td colspan="2">- C421 CD-323012 001 011 01</td></tr><tr><td colspan="3">REV. NO. DATE DESCRIPTION</td><td colspan="2">OPRG. DEPT. CTPC</td><td colspan="2">ENG. DEPT. AUT-PSAC</td><td colspan="3">RIYADH SAUDI ARABIA</td><td colspan="2">NG/D2-D (2012/01) DMS VECTOR NGD200</td></tr></table>										AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		CONTENTS SHEET			<div>الشركة الوطنية لنقل الكهرباء</div> <div> <b>نقل الكهرباء</b> National Grid sa</div>		01 13 49 FACTORY ASBUILT			DRAWN BY RIZ		CHECKED BY KVR		132kV FIBER OPTIC PANEL +FOIP			INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO.		00 13 04 FOR APPROVAL			DATE STARTED 24.01.2013		DATE COMPLETED		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY			- C421 CD-323012 001 011 01		REV. NO. DATE DESCRIPTION			OPRG. DEPT. CTPC		ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA			NG/D2-D (2012/01) DMS VECTOR NGD200	
AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		CONTENTS SHEET			<div>الشركة الوطنية لنقل الكهرباء</div> <div> <b>نقل الكهرباء</b> National Grid sa</div>																																																
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REV. NO. DATE DESCRIPTION			OPRG. DEPT. CTPC		ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA			NG/D2-D (2012/01) DMS VECTOR NGD200																																																





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A	LEGENDS									
	± RI	DC SUPPLY - MAIN PROTECTION / TCS				ON	CB NORMALLY OPEN AUXILIARY CONTACT			
	± R2	DC SUPPLY - SECONDARY PROTECTION / TCS				OFF	CB NORMALLY CLOSED AUXILIARY CONTACT			
	± R3	DC SUPPLY - BACK UP PROTECTION				A	COMMON			
	± IT	DC SUPPLY - INTER TRIP				T	TEST POSITION			
B	± S1	DC SUPPLY - ALARM UNIT - 1				S	SERVICE POSITION			
	± S2	DC SUPPLY - ALARM UNIT - 2				CS	CLOSE IN SERVICE POSITION			
	± S3	DC SUPPLY - ALARM UNIT - 3								
	± S4	DC SUPPLY - ALARM UNIT - 4								
	ISC ±	DC SUPPLY - INDICATIONS IN CONTROL PANEL				CT	CLOSE IN TEST POSITION			
	ISCL	DC SUPPLY - LAMP TEST IN CONTROL PANEL				LS	LOCAL SERVICE			
	ISR ±	DC SUPPLY - INDICATIONS IN RELAY PANEL				LT	LOCAL TEST			
	ISRL	DC SUPPLY - LAMP TEST IN RELAY PANEL				LC	LOCAL CLOSE			
	FL	DC SUPPLY - FLASHING CIRCUIT				LO	LOCAL OPEN			
	BB RS ±	DC SUPPLY - BUS BAR - PROTECTION RESET				RO	REMOTE OPEN			
	BB CBF ±/CBF ±	DC SUPPLY - CBF PROTECTION								
	FRI ±	DC SUPPLY - FAULT RECORDER - 1								
	FR2 ±	DC SUPPLY - FAULT RECORDER - 2								
	AN ±	DC SUPPLY - ALARM UNITS								
	AD	ACKNOWLEDGE BUS - ALARM SYSTEM								
	R	RESET BUS - ALARM SYSTEM								
	CR	CONTROL ROOM								
	NCC	NATIONAL CONTROL CENTRE								
	LOCAL	THE LOCATION OF CONTROLLED DEVICE								
	REMOTE	ANY OTHER LOCATION NOT LOCAL								
	XNCC	CB / ISOLATOR ZYX - CONTROL COMMON TO NCC								
	XNCCC	CB / ISOLATOR ZYX - CONTROL CLOSE FROM NCC								
	XNCCO	CB / ISOLATOR ZYX - CONTROL OPEN FROM NCC								
	XCR	CB / ISOLATOR ZYX - OPERATION FROM CONTROL ROOM								
	XRC	CB / ISOLATOR ZYX - CLOSE FROM REMOTE								
	XRO	CB / ISOLATOR ZYX - OPEN FROM REMOTE								
E	XRCT	CB ZYX - REMOTE CLOSE "TEST" POSITION								
	XRCS	CB ZYX - REMOTE CLOSE "SERVICE" POSITION								
	XRO	CB ZYX - REMOTE OPEN								
	XCRO	CB ZYX - OPEN FROM CONTROL ROOM								
	XCRC	CB ZYX - CLOSE FROM CONTROL ROOM								
		(ZYX - DENOTES DEVICE NO e.g. I34,I36 OR I30 ETC. Ex: 34NCCC DENOTES CLOSING OF ISOLATOR I34 FROM NCC) 30CRC DENOTES CB I30 CLOSE COMMAND FROM CONTROL ROOM)								
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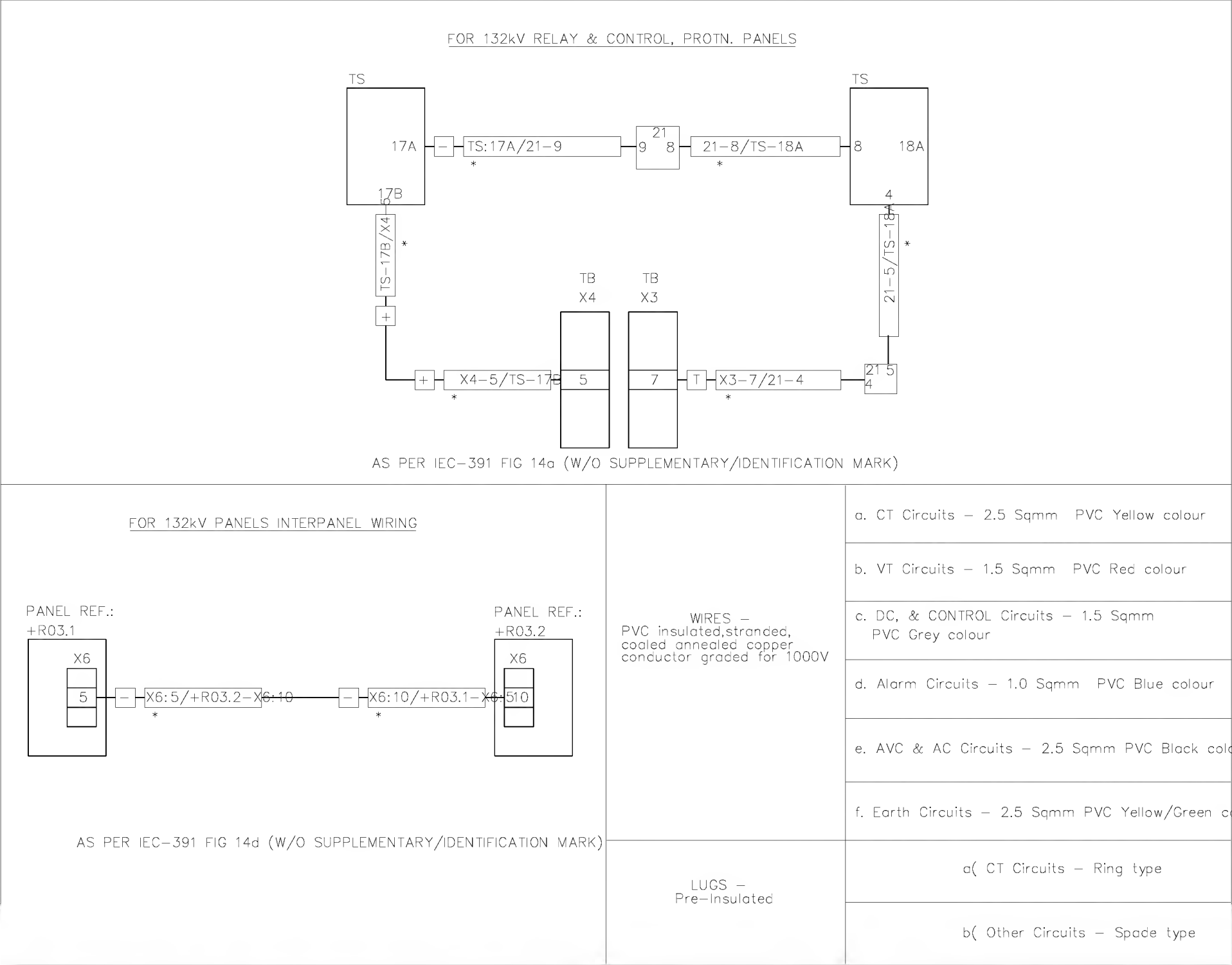


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NOTE:1 ADDITIONAL MARKING AS APPLICABLE

NOTE:2 FERRULE NUMBERING WILL BE BLACK LETTERS ON YELLOW TUBE

3.2 mm for 1.5 sq mm wires and

4.2 mm for 2.5 sq mm wires

( As per 31-TMSS-1, REV 0 )

NOTE:3 STARTING POINT OF THE FERRULE LEFT TO RIGHT

AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		FERRULE AND WIRING DETAILS		<div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div>					
			DRAWN BY <u>  RIZ  </u> CHECKED BY <u>  KVR  </u>		132kV FIBER OPTIC PANEL +FOIP									
01	13 49	FACTORY ASBUILT	DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY									
00	13 04	FOR APPROVAL	OPRG. DEPT. <u>  CTPD  </u> ENG. DEPT. <u>  AUT-PSAC  </u>		RIYADH		SAUDI ARABIA		INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.		REV. NO.
REV. NO.	DATE	DESCRIPTION							-	C421	CD-323012	SHT	CONT.	01
												014	015	

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MANUFACTURER	SCHEMATICS DWG.NO	PANEL DESCRIPTION	PANEL REFERENCE
		SS 8709 132kV RELAY PANELS	
CD-322928		132/13.8kV GT-1 RELAY PANEL -1	+R05.1
		132/13.8kV GT-1 RELAY PANEL -2	+R05.2
CD-322931		132/13.8kV GT-2 RELAY PANEL -1	+R01.1
		132/13.8kV GT-2 RELAY PANEL -2	+R01.2
CD-322934		132/13.8kV GT-3 RELAY PANEL -1	+R04.1
		132/13.8kV GT-3 RELAY PANEL -2	+R04.2
CD-322936		132/13.8kV TRANSFORMER-1,2& 3 AVC PANEL	+AVC
CD-322922		132KV SPARE-1 UGF RELAY PANEL -1	+R07.1
		132KV SPARE-1 UGF RELAY PANEL -2	+R07.2
CD-322916		132KV 8020 UGF RELAY PANEL -1	+R02.1
		132KV 8020 UGF RELAY PANEL -2	+R02.2
CD-322919		132KV 8710 UGF RELAY PANEL -1	+R03.1
		132KV 8710 UGF RELAY PANEL -2	+R03.2
CD-322925		132KV SPARE-2 UGF RELAY PANEL -1	+R06.1
		132KV SPARE-2 UGF RELAY PANEL -2	+R06.2
CD-323012		132KV FOIP PANEL	+FOIP
CD-322946		132kV BUS COUPLER-A	+R130
CD-322948		132kV BUS COUPLER-B	+R230
CD-322950		132kV BUS SECTION	+R120
CD-322991		132kV BUSBAR PROTECTION MAIN-1 CENTRAL UNIT PANEL	+BB1-1
CD-322993		132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL	+BB1-2
CD-322995		132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL	+BB1-3
CD-322997		132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL	+BB1-4
CD-322999		132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL	+BB1-5
CD-323001		132kV BUSBAR PROTECTION MAIN-2 CENTRAL UNIT PANEL	+BB2-1
CD-323003		132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL	+BB2-2
CD-323005		132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL	+BB2-3
CD-323007		132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL	+BB2-4
CD-323009		132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL	+BB2-5



PROTECTION & SUBSTATION  
AUTOMATION

AS-BUILT BY \_\_\_\_\_ DATE \_\_\_\_\_ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL
REV. NO.	DATE	DESCRIPTION

DRAWN BY RIZ CHECKED BY KVR  
DATE STARTED 24.01.2013 DATE COMPLETED \_\_\_\_\_  
OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

DRAWING REFERENCES

132kV FIBER OPTIC PANEL +FOIP  
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY  
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.		REV. NO.
-	C421	CD-323012	SHT	CONT.	01
			015	016	


NG/D2-D (2012/01)

DMS

VECTOR

NGD200

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D										
E										
F										

MANUFACTURER	SCHEMATICS DWG.NO	PANEL DESCRIPTION	PANEL REFERENCE
 PROTECTION & SUBSTATION AUTOMATION		SS 8709 13.8KV RELAY PANELS	
	CD-322952	13.8KV Capacitor Bank-1 Protection Panel	+CBP-1
	CD-322954	13.8KV Capacitor Bank-2 Protection Panel	+CBP-2
	CD-322956	13.8KV Capacitor Bank-2 Protection Panel	+CBP-3
	CD-322958	13.8 KV ACCS PANEL	+ACCS
	CD-322962	13.8KV ACSE PANEL	+ACSE
	CD-322968	13.8KV Under Voltage Load Shedding Panel	+UVLS
	CD-322964	13.8KV Under Frequency Load Shedding Panel-1	+UFLS01
	CD-322966	13.8KV Under Frequency Load Shedding Panel-2	+UFLS02

AS-BUILT BY \_\_\_\_\_ DATE \_\_\_\_\_

CONTRACT NO. 11131113/00

JOB ORDER NO. S-13656

01

13 49

FACTORY ASBUILT

00

13 04

FOR APPROVAL

REV. NO.

DATE

DESCRIPTION

DRAWN BY RIZ

CHECKED BY KVR

DATE STARTED 24.01.2013

DATE COMPLETED \_\_\_\_\_

OPRG. DEPT. CTPD

ENG. DEPT. AUT-PSAC


DRAWING REFERENCES

132kV FIBER OPTIC PANEL +FOIP

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



National Grid sa

INDEX

PLANT NO.

DRAWING NUMBER

SHEET NO.

SHTCONT.

REV. NO.

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C421

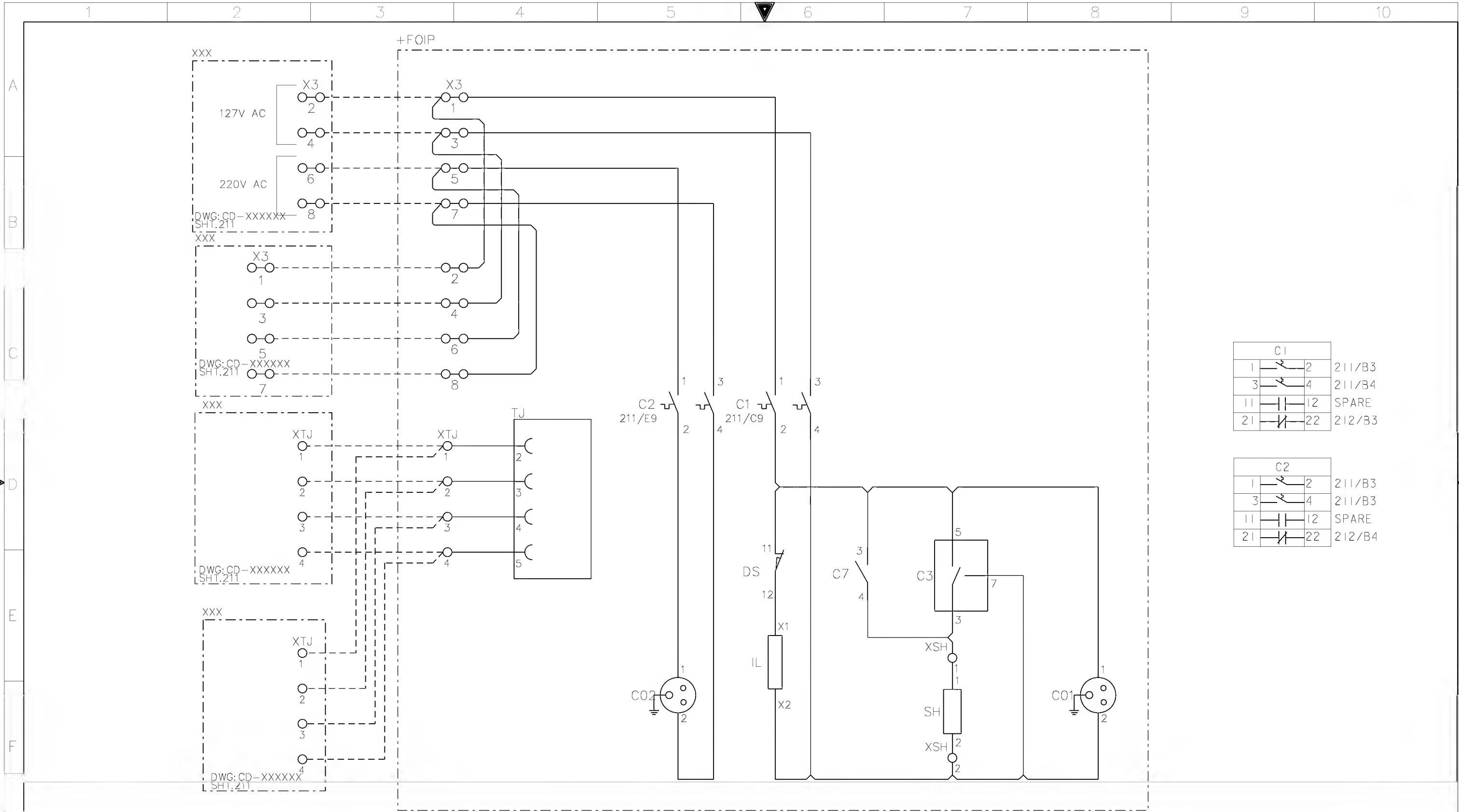
CD-323012

016

211

01





C1			
1	2	211/B3	
3	4	211/B4	
11	12	SPARE	
21	22	212/B3	

C2			
1	2	211/B3	
3	4	211/B3	
11	12	SPARE	
21	22	212/B4	

AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656	
01	13 49	FACTORY ASBUILT	DRAWN BY RIZ		CHECKED BY KVR	
00	13 04	FOR APPROVAL	DATE STARTED 24.01.2013		DATE COMPLETED _____	
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC	

AC SUPPLY DISTRBUTION	
132kV FIBER OPTIC PANEL +FOIP	
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY	
RIYADH SAUDI ARABIA	

الشركة الوطنية لنقل الكهرباء			 نقل الكهرباء National Grid SA		
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.		REV. NO.
-	C421	CD-323012	SHT	CONT.	01
			211	212	

A

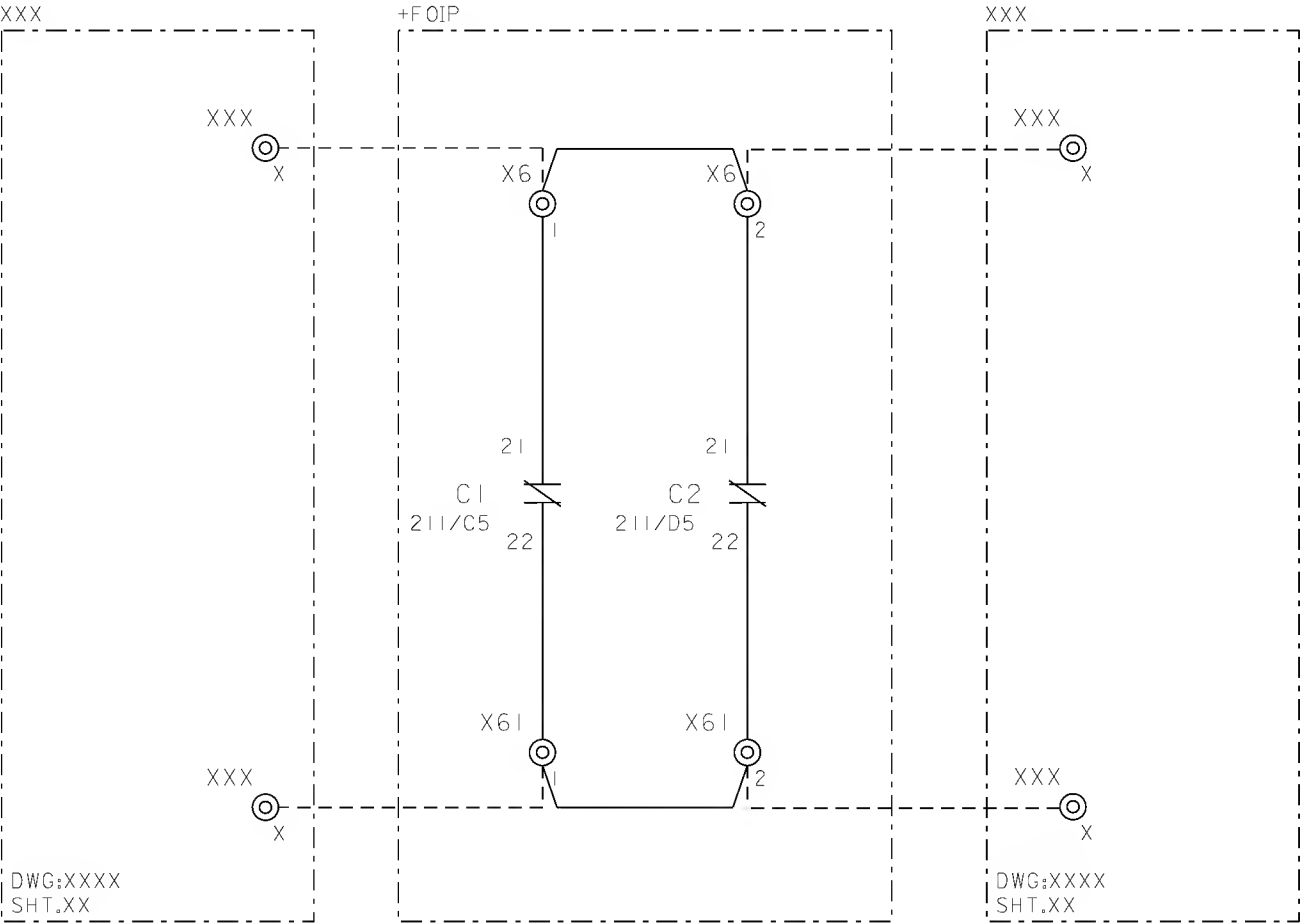
B

C

D

E

F



DWG:XXXX  
SHT.XX

DWG:XXXX  
SHT.XX

AS-BUILT BY \_\_\_\_\_ DATE \_\_\_\_\_ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

01	13 49	FACTORY ASBUILT	DRAWN BY RIZ	CHECKED BY KVR
00	13 04	FOR APPROVAL	DATE STARTED 24.01.2013	DATE COMPLETED
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD	ENG. DEPT. AUT-PSAC

AC MCB AUX CONTACTS.

132kV FIBER OPTIC PANEL +FOIP

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY  
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



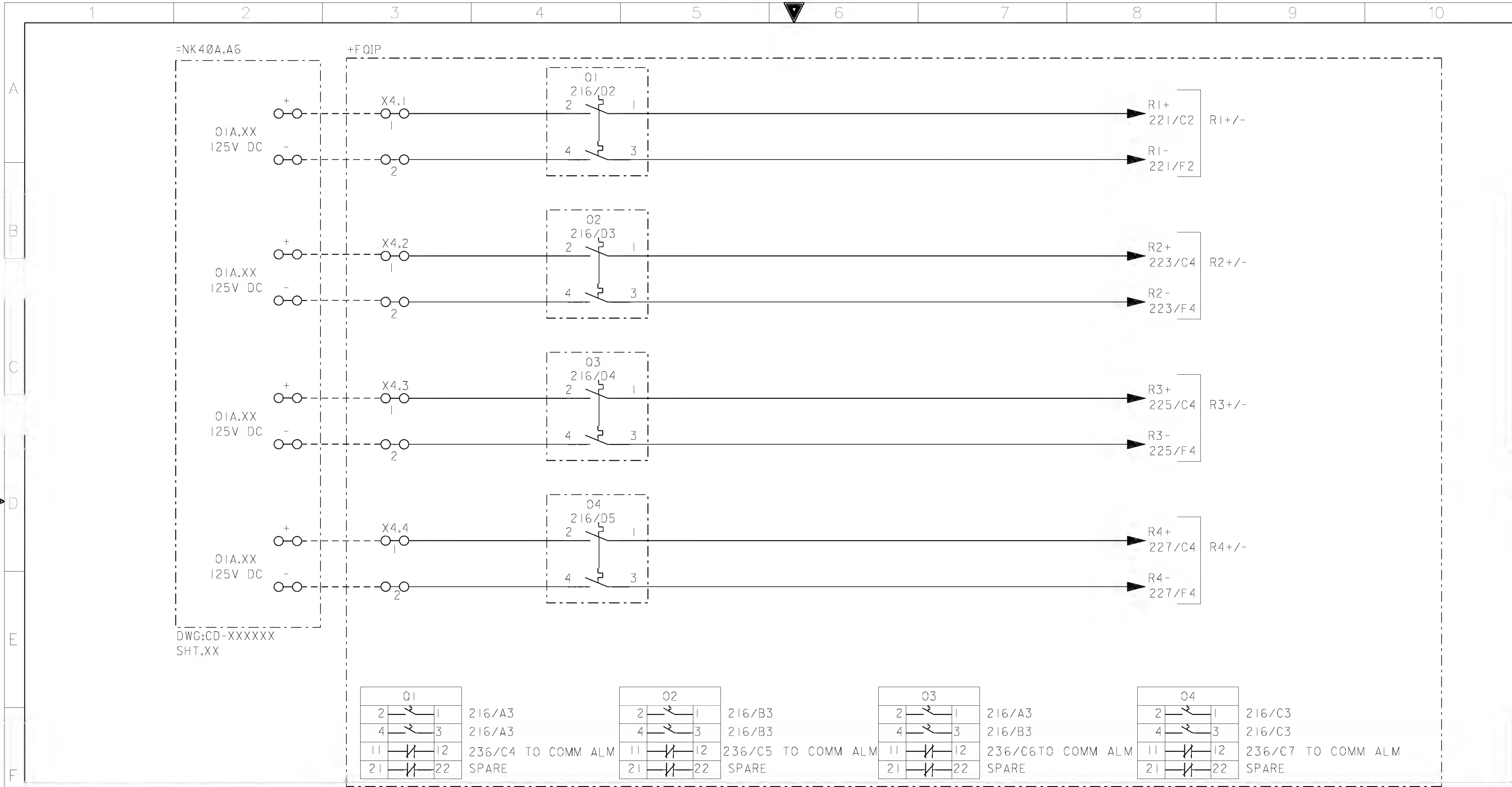
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
-	C421	CD-323012	SHT 212	CONT. 216
				01


NG/D2-D (2012/01)

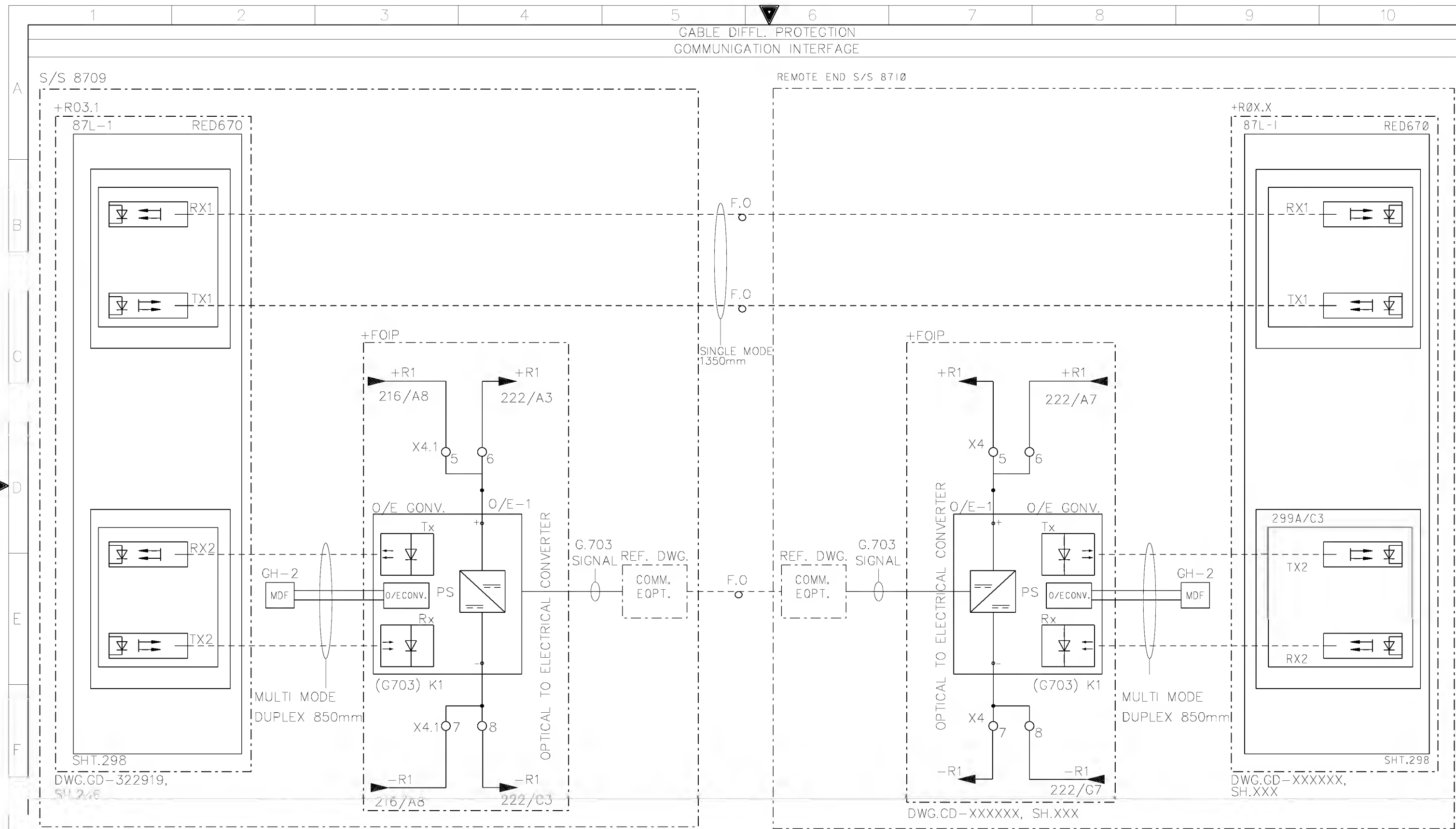
DMS


VECTOR

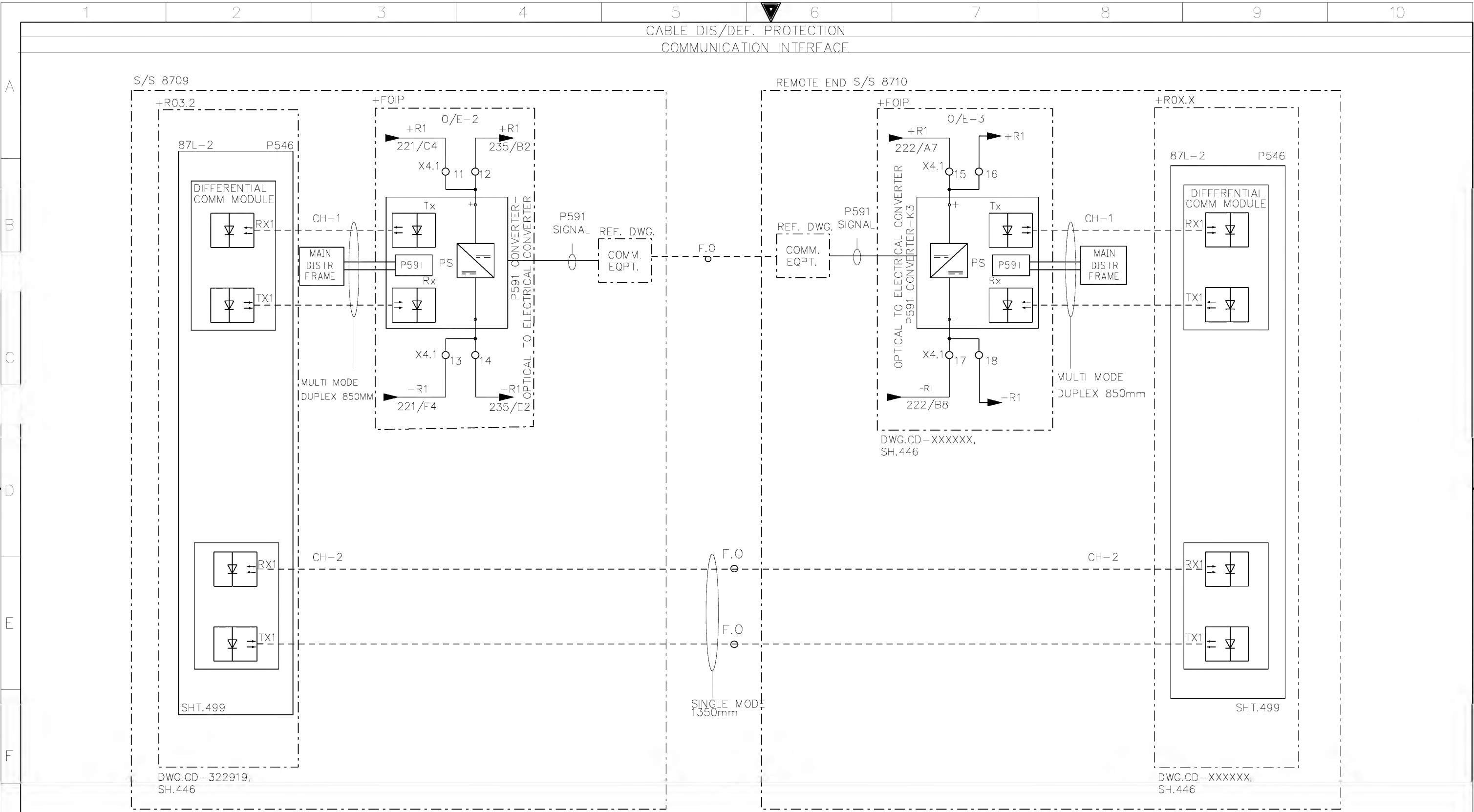
NGD200



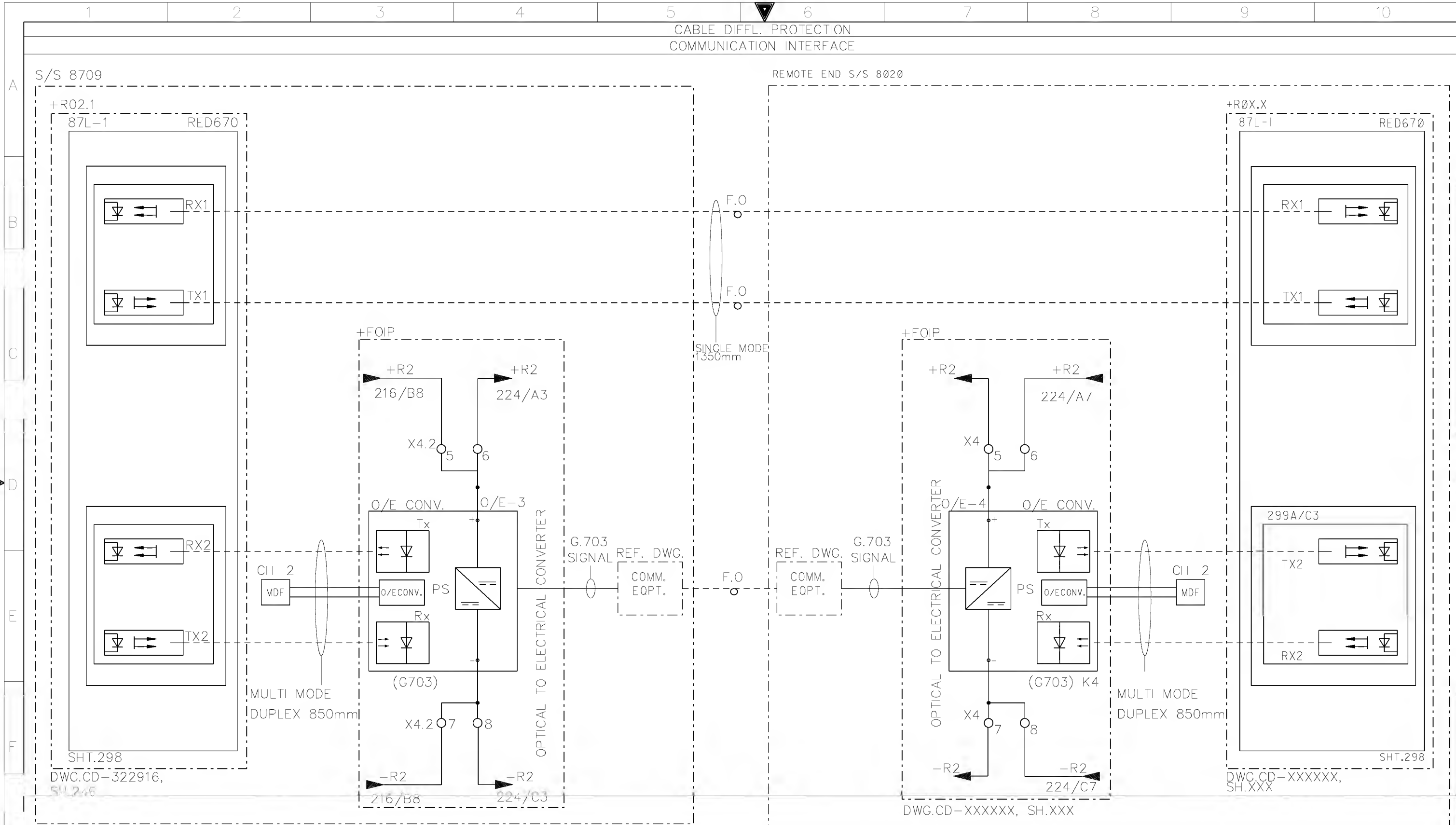
AS-BUILT BY _____ DATE _____			CONTRACT NO. 1113/113/00		JOB ORDER NO. S-13656		DC SUPPLY DISTRBUTION			الشركة الوطنية لنقل الكهرباء National Grid sa											
			DRAWN BY RIZ CHECKED BY KVR			132kV FIBER OPTIC PANEL +FOIP															
			DATE STARTED 24.01.2013 DATE COMPLETED _____			S/S 8709 - 132/13.8KV IN AL-KHARJ CITY															
REV. NO.			DATE			DESCRIPTION			OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC												
01			13 49			FACTORY ASBUILT						INDEX		PLANT NO.		DRAWING NUMBER		SHEET NO.		REV. NO.	
00			13 04			FOR APPROVAL												SHT		CONT.	
																		216		221	
																				01	



AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		COMMUNICATION INTERFACE-UGF 8710			<div><div><b>نقل الكهرباء</b> الشركة الوطنية لنقل الكهرباء National Grid sa</div></div>						
			DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u>				132kV FIBER OPTIC PANEL +FOIP									
G	01	13 49	FACTORY ASBUILT		DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY			INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.
	00	13 04	FOR APPROVAL				RIYADH SAUDI ARABIA			-	C421	CD-323012		SHT	CONT.	01
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>									221	222	



AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		COMMUNICATION INTERFACE-UGF 8710			<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div>						
			DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u>				132kV FIBER OPTIC PANEL +FOIP									
01 13 49 FACTORY ASBUILT			DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____				S/S 8709 - 132/13.8KV IN AL-KHARJ CITY			INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.
00 13 04 FOR APPROVAL			OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>				RIYADH SAUDI ARABIA			-	C421	CD-323012		SHT	CONT.	01
REV. NO. DATE DESCRIPTION														222	223	



AS-BUILT BY \_\_\_\_\_ DATE \_\_\_\_\_ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

01	13 49	FACTORY ASBUILT	DRAWN BY RIZ	CHECKED BY KVR
00	13 04	FOR APPROVAL	DATE STARTED 24.01.2013	DATE COMPLETED _____
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD	ENG. DEPT. AUT-PSAC

COMMUNICATION INTERFACE-UGF 8020

132kV FIBER OPTIC PANEL +FOIP

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY  
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



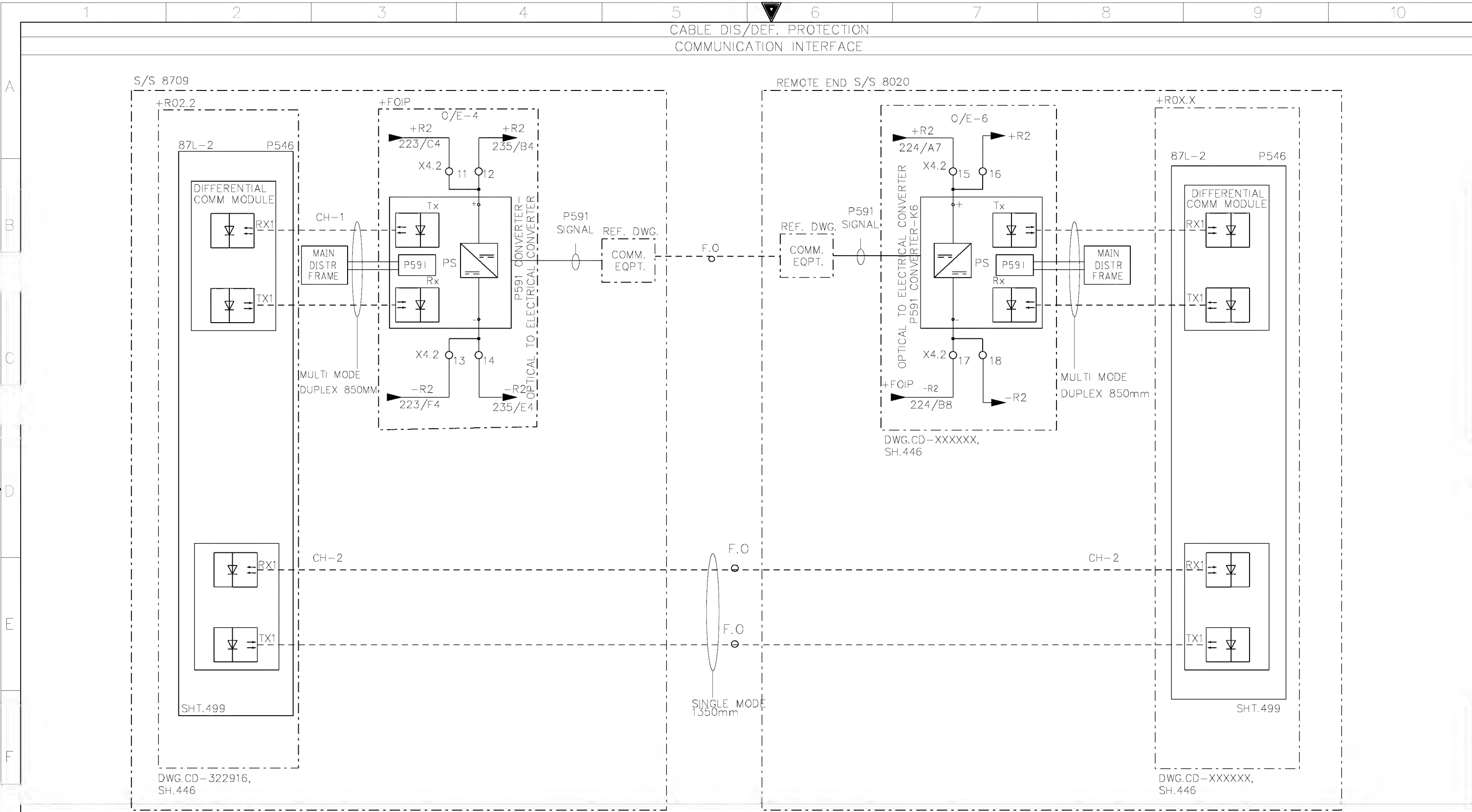
National Grid sa

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
-	C421	CD-323012	SHT 223	CONT. 224
				01

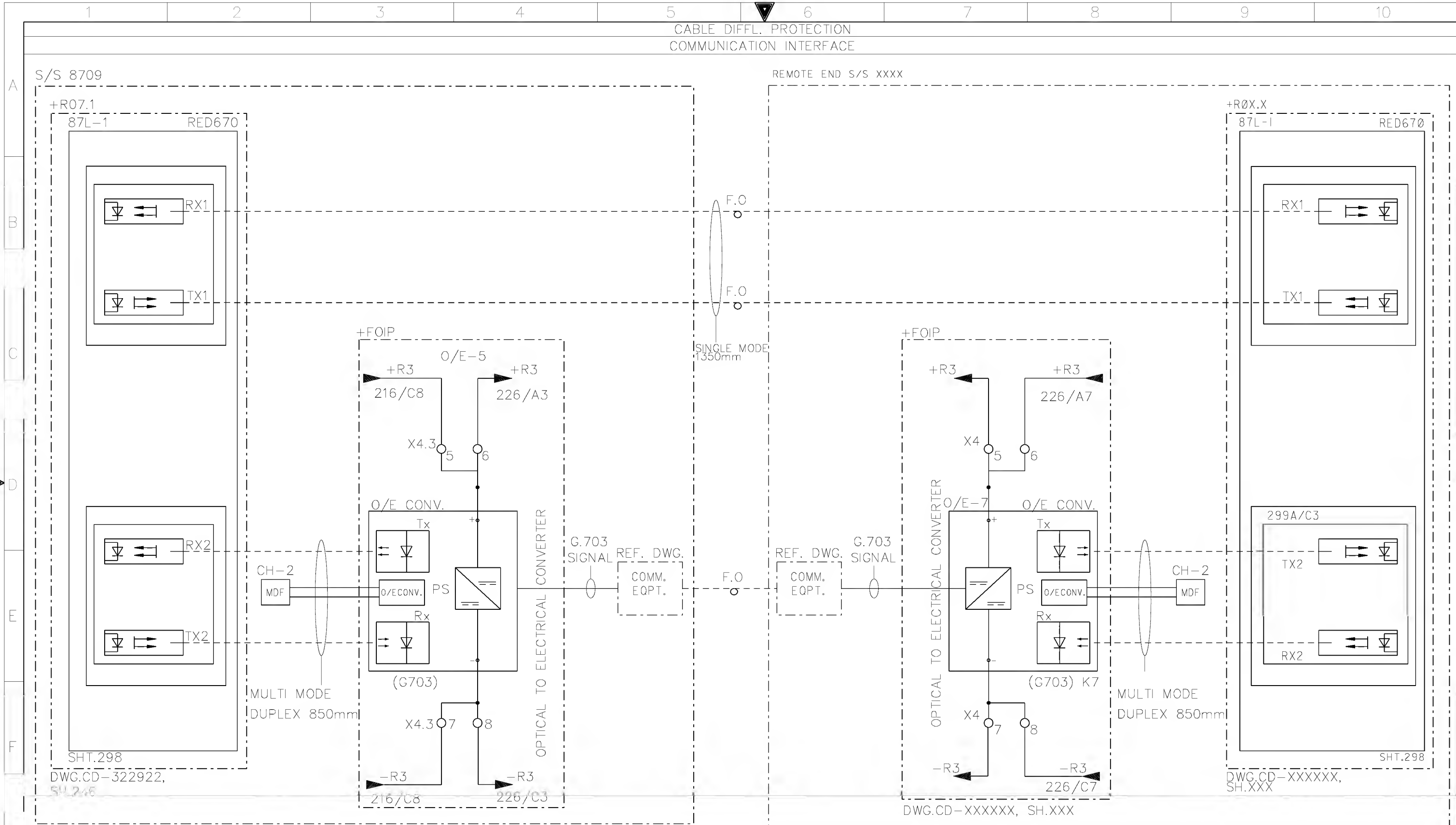
DMS

VECTOR

NGD200

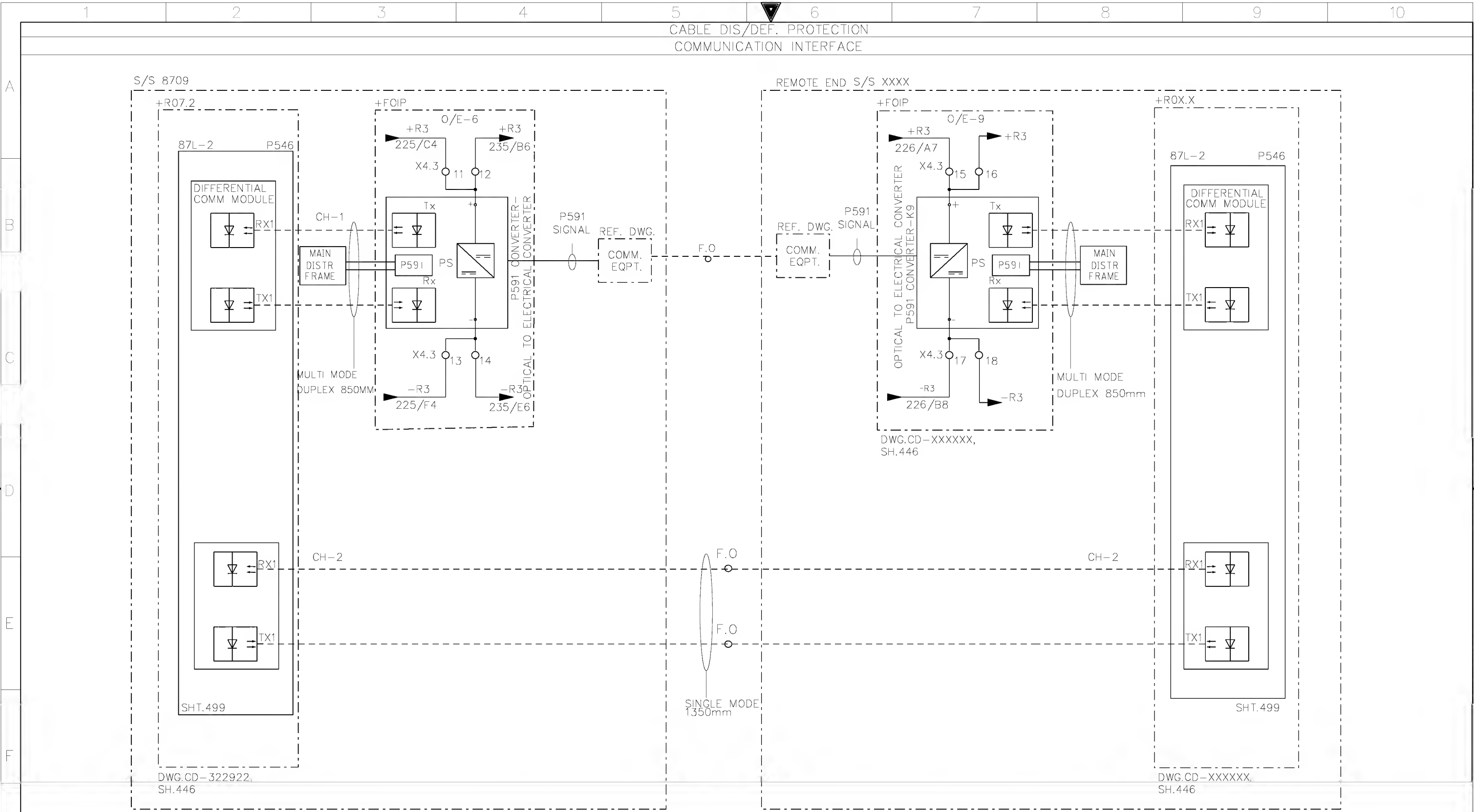


AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		COMMUNICATION INTERFACE-UGF 8020			<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div>				
			DRAWN BY RIZ		CHECKED BY KVR		132kV FIBER OPTIC PANEL +FOIP							
01 13 49			FACTORY ASBUILT		DATE STARTED 24.01.2013		DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY					
00 13 04			FOR APPROVAL		OPRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA					
REV. NO.			DATE		DESCRIPTION				INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.		REV. NO.
									-	C421	CD-323012	SHT	CONT.	01
												224	225	



AS-BUILT BY _____ DATE _____			CONTRACT NO. 1113/113/00		JOB ORDER NO. S-13656		COMMUNICATION INTERFACE-UGF SPARE-A			<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div>				
			DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u>				132kV FIBER OPTIC PANEL +FOIP							
01	13 49	FACTORY ASBUILT		DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY		INDEX		PLANT NO.	DRAWING NUMBER	SHEET NO.		REV. NO.
00	13 04	FOR APPROVAL		OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>		RIYADH SAUDI ARABIA		-	C421	CD-323012		SHT	CONT.	01
REV. NO.	DATE	DESCRIPTION										225	226	

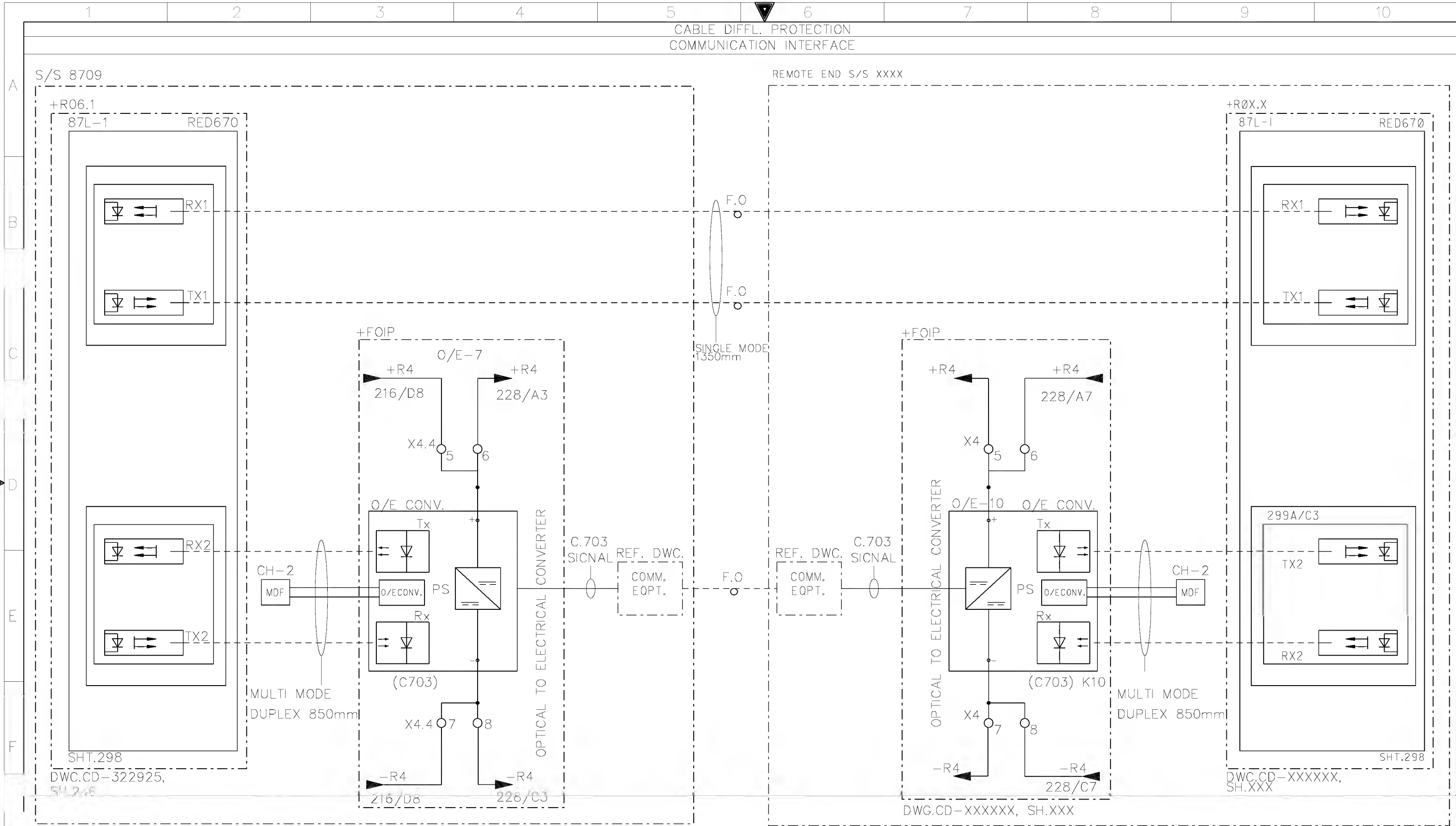




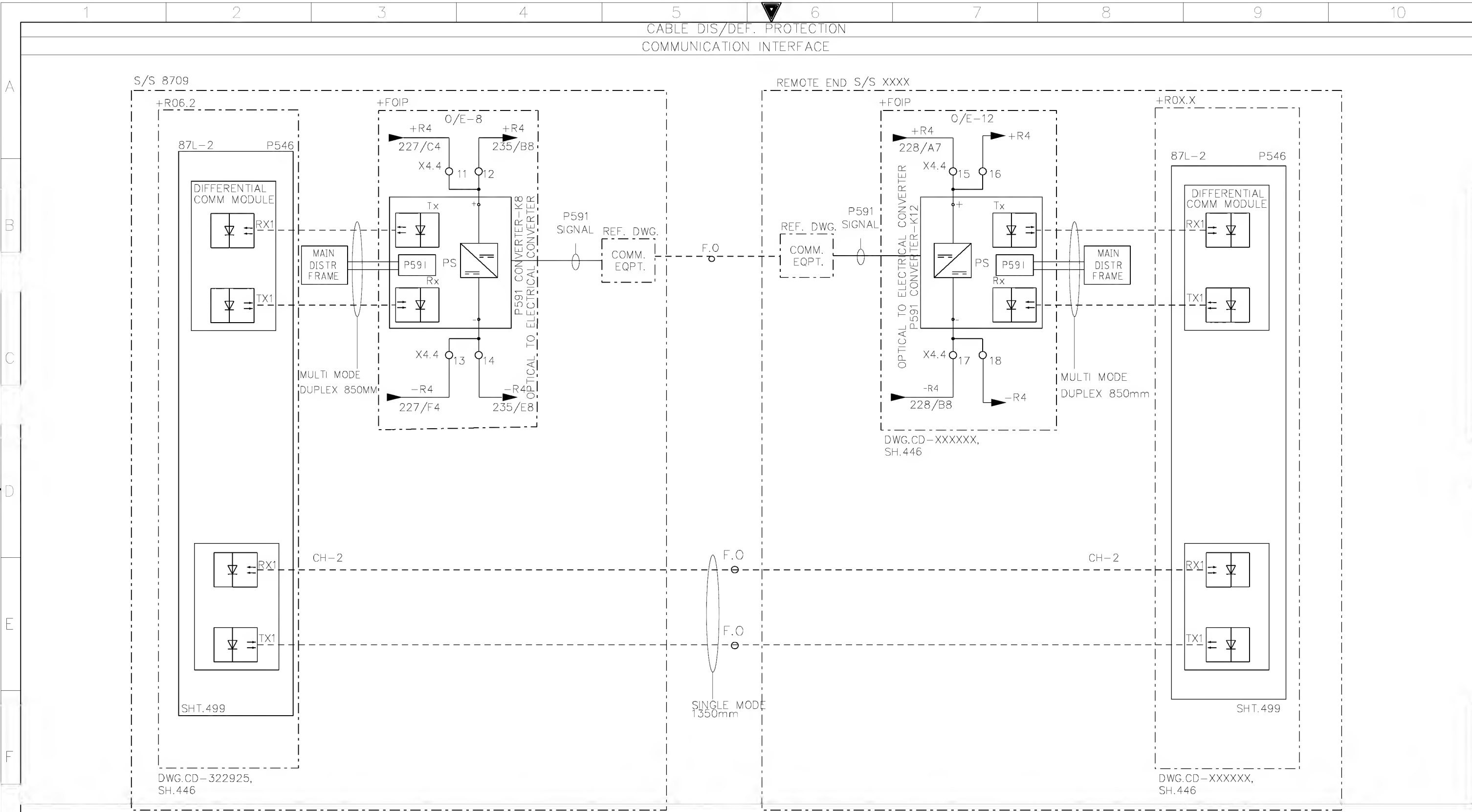
AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656	
01	13 49	FACTORY ASBUILT	DRAWN BY RIZ		CHECKED BY KVR	
00	13 04	FOR APPROVAL	DATE STARTED 24.01.2013		DATE COMPLETED _____	
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC	

COMMUNICATION INTERFACE-UGF SPARE-A  
132kV FIBER OPTIC PANEL +FOIP  
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY  
RIYADH SAUDI ARABIA

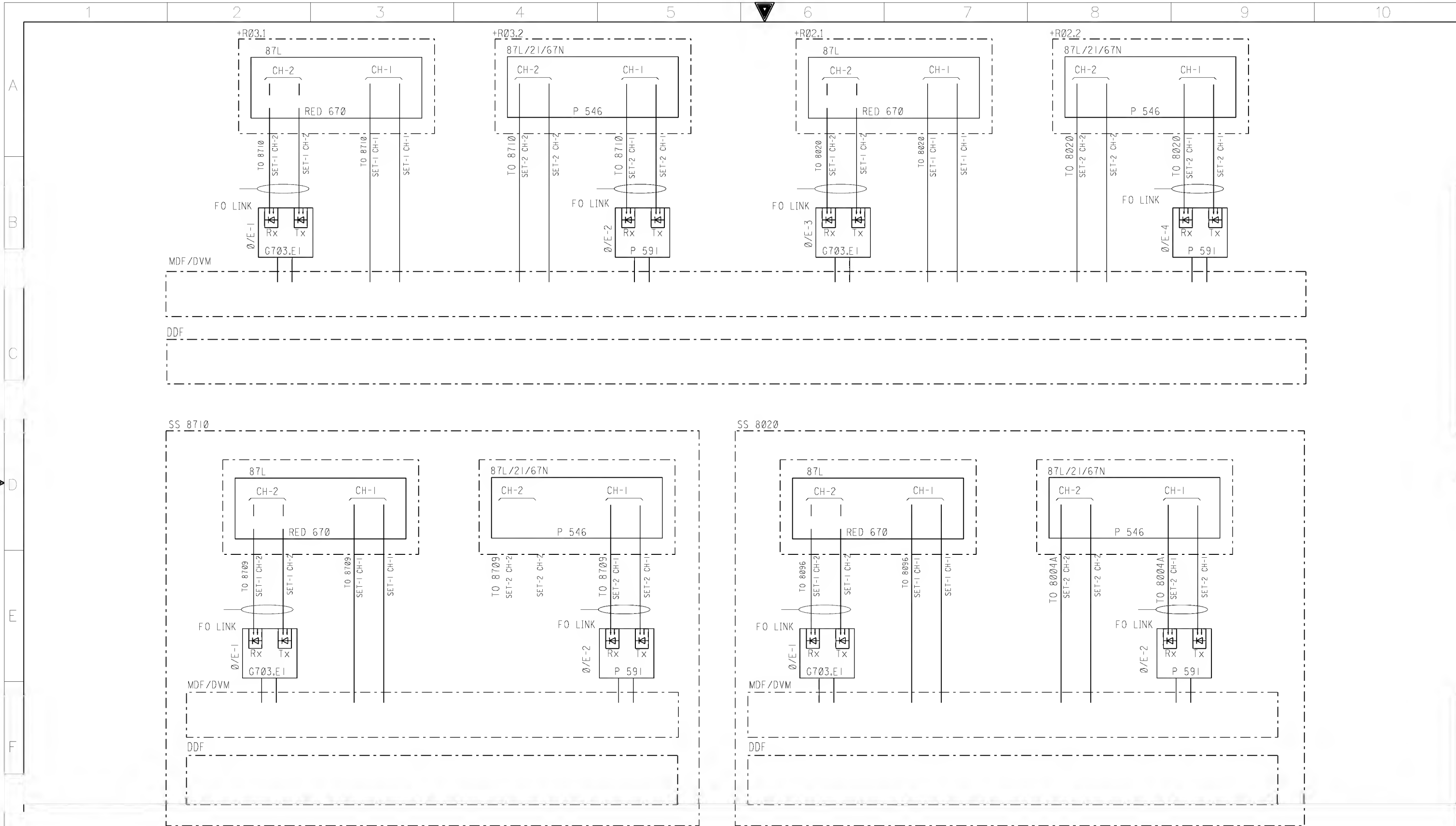
الشركة الوطنية لنقل الكهرباء					نقل الكهرباء	
					National Grid sa	
INDEX	PLANT NO.	DRAWING NUMBER			SHEET NO.	
-	C421	CD-323012			SHT	CONT.
					226	227
			REV. NO. 01			



AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		COMMUNICATION INTERFACE-UGF SPARE-B			<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div>							
			DRAWN BY RIZ		CHECKED BY KVR		132kV FIBER OPTIC PANEL +FOIP										
01	13 49	FACTORY ASBUILT		DATE STARTED 24.01.2013		DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY			INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.
00	13 04	FOR APPROVAL		OPRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA			-	C421	CD-323012		SHT	CONT.	01
REV. NO.	DATE	DESCRIPTION															



G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		COMMUNICATION INTERFACE-UGF SPARE-B		<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div>						
					DRAWN BY RIZ	CHECKED BY KVR	132kV FIBER OPTIC PANEL +FOIP								
	01	13 49	FACTORY ASBUILT		DATE STARTED 24.01.2013		DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY						
	00	13 04	FOR APPROVAL		OPRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA						
	REV. NO.	DATE	DESCRIPTION						INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.
									-	C421	CD-323012		SHT 228	CONT. 229	01



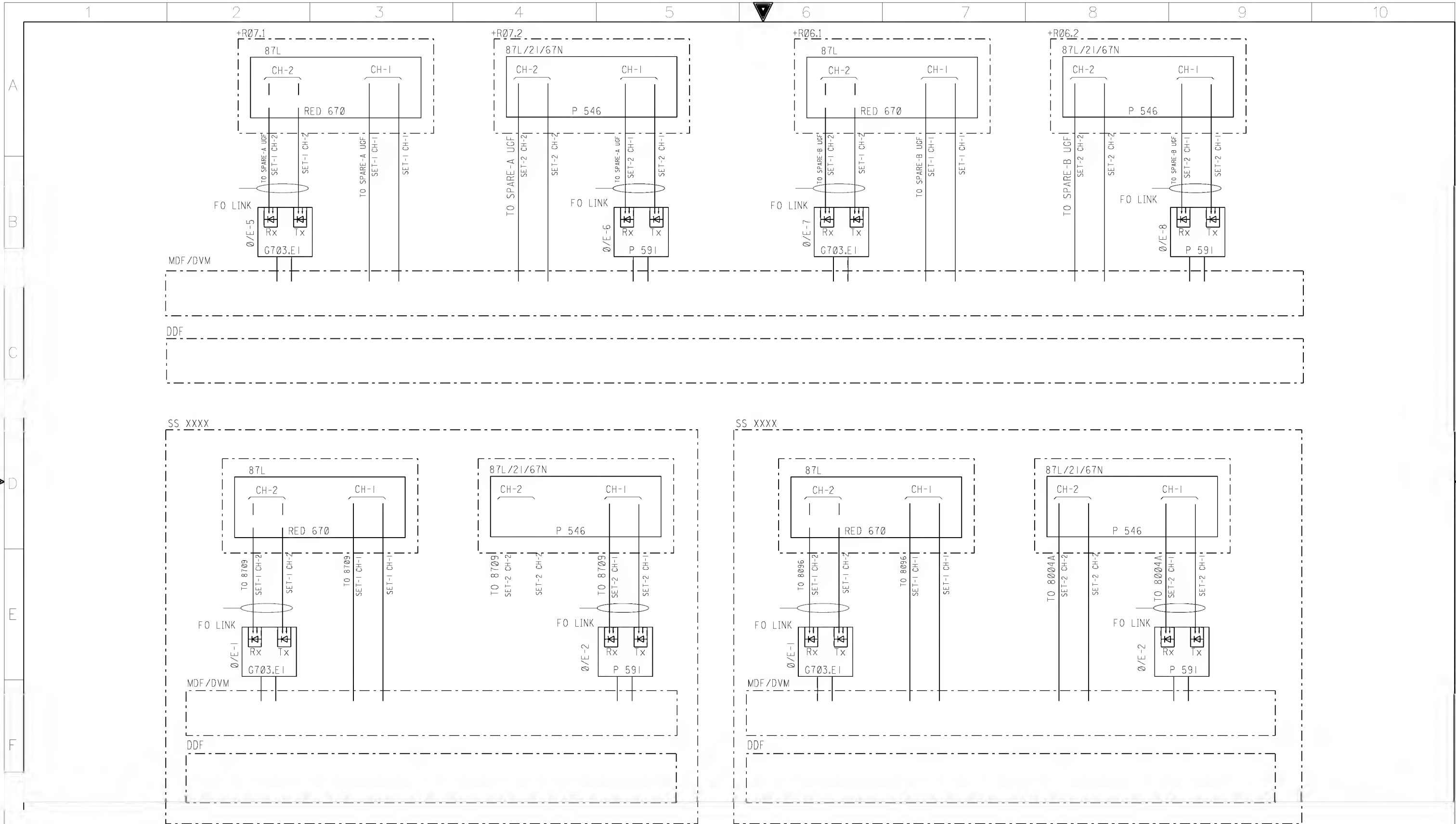
AS-BUILT BY \_\_\_\_\_ DATE \_\_\_\_\_ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL
REV. NO.	DATE	DESCRIPTION

DRAWN BY	RIZ	CHECKED BY	KVR
DATE STARTED	24.01.2013	DATE COMPLETED	
OPRG. DEPT.	CTPD	ENG. DEPT.	AUT-PSAC

COMMUNICATION INTERFACE-UGF 8710 & 8020  
132kV FIBER OPTIC PANEL +FOIP  
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY  
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء		National Grid sa	
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.
-	C421	CD-323012	229/230
		REV. NO.	01



AS-BUILT BY \_\_\_\_\_ DATE \_\_\_\_\_ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL
REV. NO.	DATE	DESCRIPTION

DRAWN BY	RIZ	CHECKED BY	KVR
DATE STARTED	24.01.2013	DATE COMPLETED	
OPRG. DEPT.	CTPD	ENG. DEPT.	AUT-PSAC

COMMUNICATION INTERFACE-UGF SPARE-A & SPRAE-B  
132kV FIBER OPTIC PANEL +FOIP  
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY  
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء		National Grid sa	
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.
-	C421	CD-323012	230
			231
			01

TELECOMMUNICATION ROOM

**+R03.2 87L/21/67N P546**

CH-1	RX	SEE NOTE-1	TX	P591	ALSTOM	PL SEE NOTE-2
	TX					
CH-2	RX			87L/21/67N		TO DDF PNL NO. PORT.2
	TX					

DIRECT FIBER

DDF PANEL TEL.COMM.ROOM

**+R03.1 87L RED670**

CH-1	RX	DIRECT FIBER	TX FIBER SYSTEM ABB	TX	TO DDF PNL NO. PORT.3
	TX				
CH-2	RX	SEE NOTE-1		G703.E1	
	TX				

DIRECT FIBER

**+R02.2 87L/21/67N P546**

CH-1	RX	SEE NOTE-1	TX	P591	ALSTOM	TO DDF PNL NO. PORT.5
	TX					
CH-2	RX			87L/21/67N		RX
	TX					

DIRECT FIBER

**+R02.1 87L RED670**

CH-1	RX	DIRECT FIBER	TX FIBER SYSTEM ABB	TX	TO DDF PNL NO. PORT.6
	TX				
CH-2	RX	SEE NOTE-1		G703.E1	
	TX				

DIRECT FIBER

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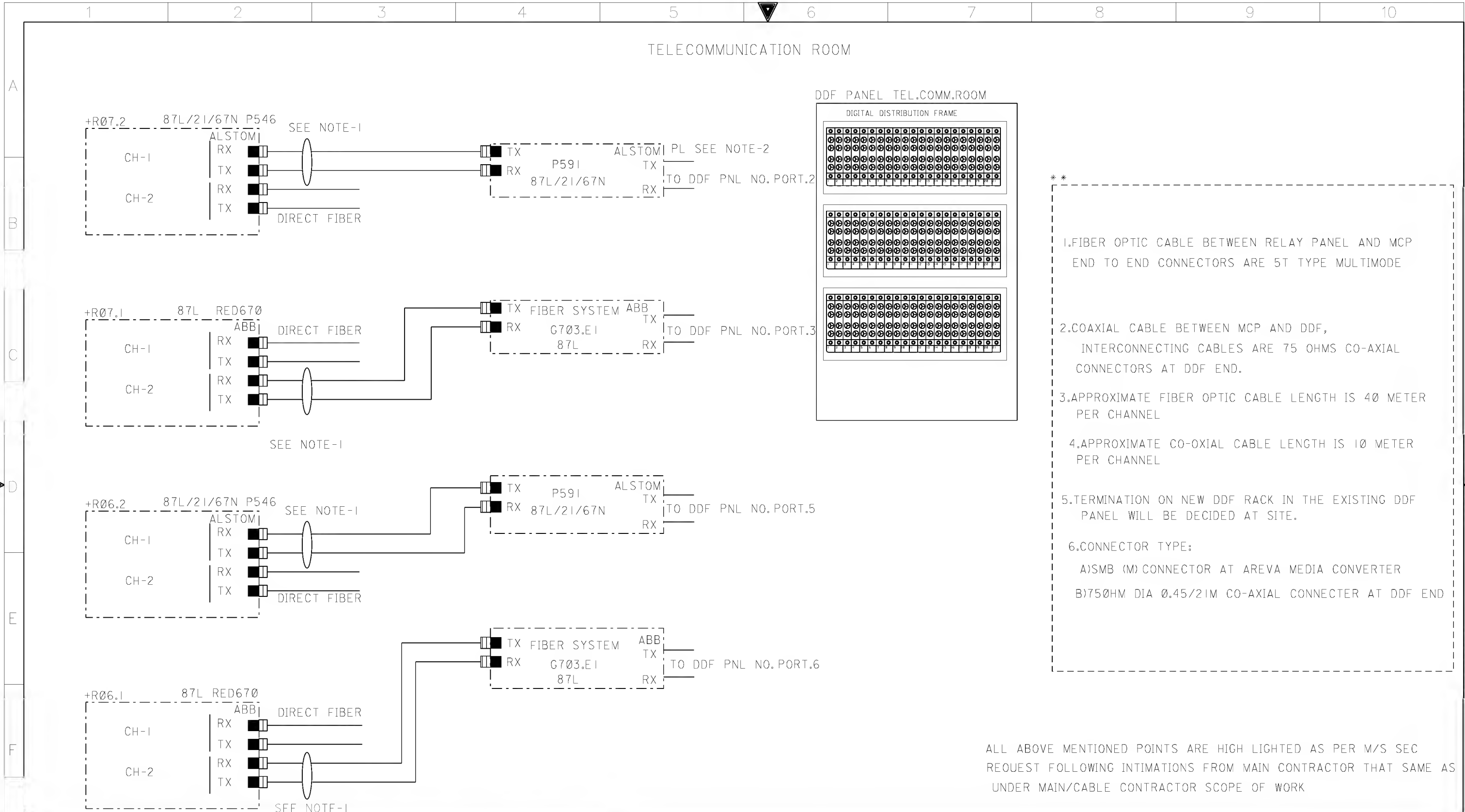
- 1.FIBER OPTIC CABLE BETWEEN RELAY PANEL AND MCP  
END TO END CONNECTORS ARE 5T TYPE MULTIMODE
- 2.COAXIAL CABLE BETWEEN MCP AND DDF,  
INTERCONNECTING CABLES ARE 75 OHMS CO-AXIAL  
CONNECTORS AT DDF END.
- 3.APPROXIMATE FIBER OPTIC CABLE LENGTH IS 40 METER  
PER CHANNEL
- 4.APPROXIMATE CO-AXIAL CABLE LENGTH IS 10 METER  
PER CHANNEL
- 5.TERMINATION ON NEW DDF RACK IN THE EXISTING DDF  
PANEL WILL BE DECIDED AT SITE.
- 6.CONNECTOR TYPE:  
A)SMB (M) CONNECTOR AT AREVA MEDIA CONVERTER  
B)750HM DIA 0.45/21M CO-AXIAL CONNECTER AT DDF END

ALL ABOVE MENTIONED POINTS ARE HIGH LIGHTED AS PER M/S SEC  
REQUEST FOLLOWING INTIMATIONS FROM MAIN CONTRACTOR THAT SAME AS  
UNDER MAIN/CABLE CONTRACTOR SCOPE OF WORK

AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		MEDIA CONVERTER ROUTING CABLE FORM-UGF 8710 & 8020	
01	13 49	FACTORY ASBUILT		DRAWN BY _____ RIZ _____ CHECKED BY _____ KVR _____		132kV FIBER OPTIC PANEL +FOIP	
00	13 04	FOR APPROVAL		DATE STARTED 24.01.2013 DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY	
REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC _____		RIYADH SAUDI ARABIA	

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.		REV. NO.
-	C421	CD-323012	SHT 233	CONT. 234	01

DMS VECTOR NGD200



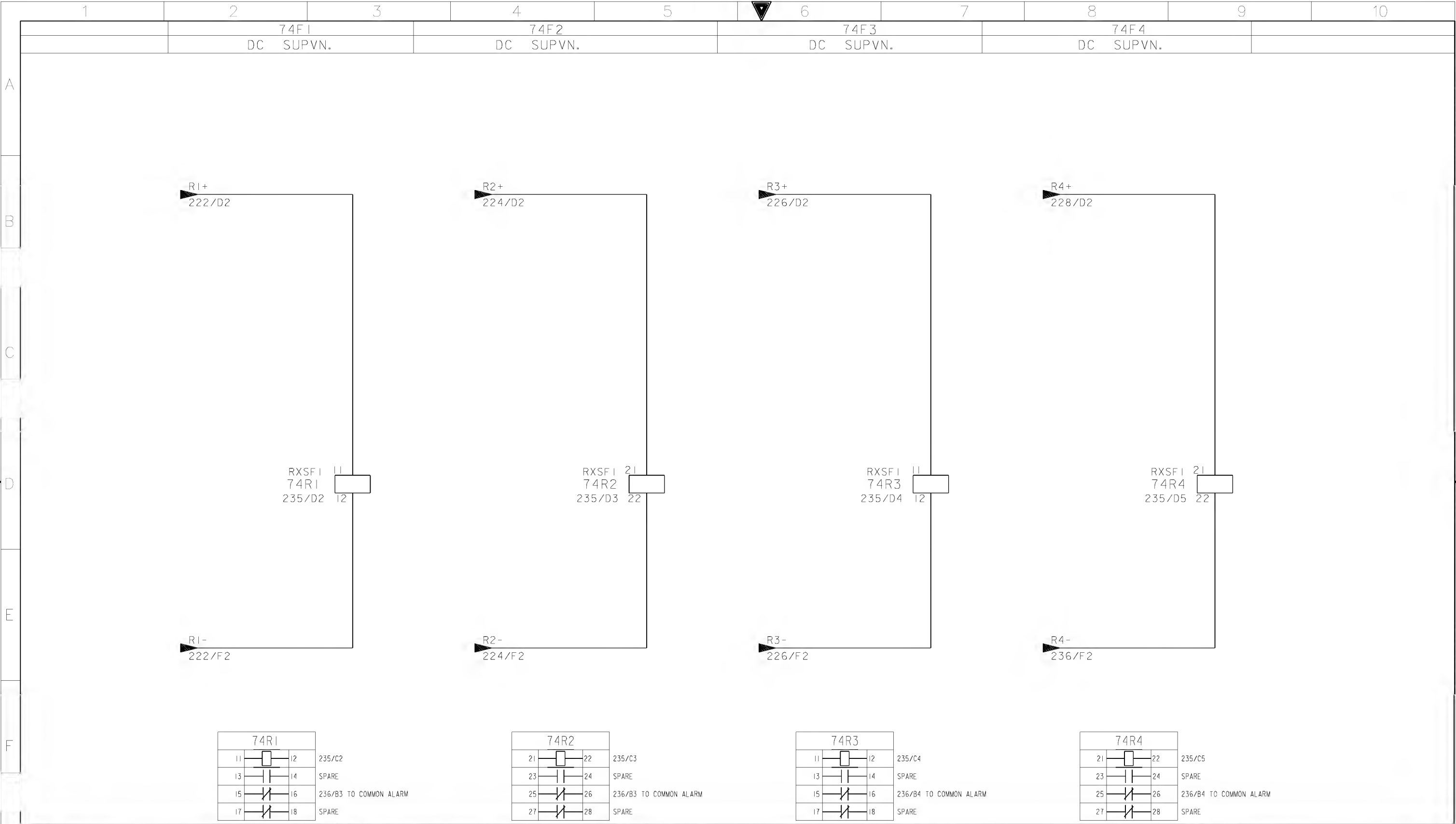
AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		MEDIA CONVERTER ROUTING CABLE FORM-UGF SPARE-A & B			الشركة الوطنية لنقل الكهرباء National Grid sa									
			DRAWN BY RIZ		CHECKED BY KVR		132kv FIBER OPTIC PANEL +FOIP			INDEX		PLANT NO.		DRAWING NUMBER		SHEET NO.		REV. NO.	
01 13 49			FACTORY ASBUILT		DATE STARTED 24.01.2013		DATE COMPLETED		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY			-		C421		CD-323012		SHT CONT.	
00 13 04			FOR APPROVAL		OPRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA							234 235		01	
REV. NO.			DATE		DESCRIPTION														


DMS

VECTOR

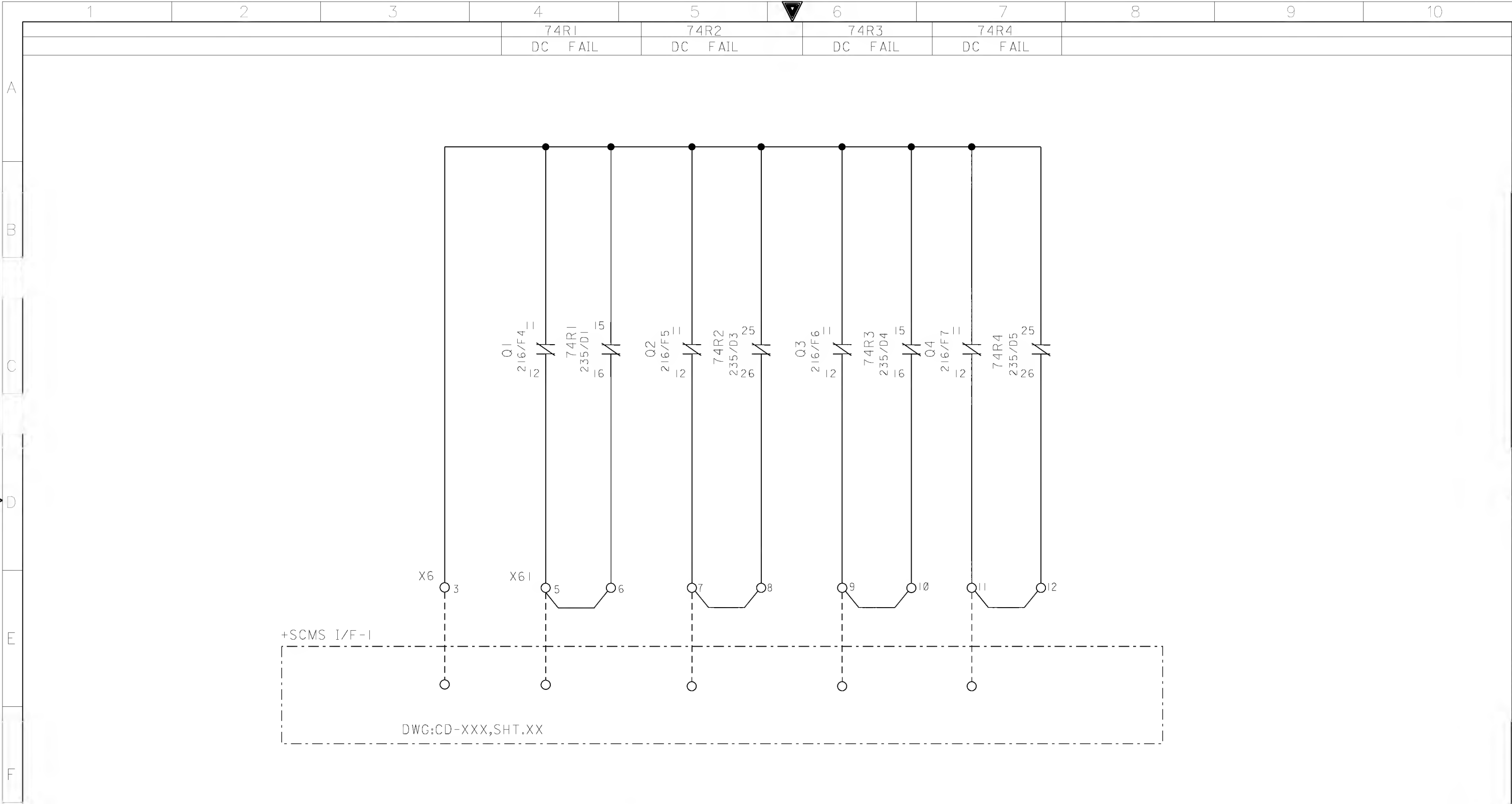
NG/D2-D (2012/01)

NGD200



AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		DC SUPPLY SUPERVISION CIRCUIT		<div>الشركة الوطنية لنقل الكهرباء</div> <div> نقل الكهرباء</div> <div>National Grid sa</div>									
			DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u>				132kV FIBER OPTIC PANEL +FOIP		INDEX		PLANT NO.		DRAWING NUMBER		SHEET NO.		REV. NO.	
01 13 49			FACTORY ASBUILT		DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY								SHT		CONT.	
00 13 04			FOR APPROVAL		OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>		RIYADH SAUDI ARABIA		-		C421		CD-323012		235		236	
REV. NO.			DATE		DESCRIPTION												01	





G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		COMMON ALARM CONTACTS		الشركة الوطنية لنقل الكهرباء نقل الكهرباء National Grid sa									
			DRAWN BY _____ RIZ _____ CHECKED BY _____ KVR				132kV FIBER OPTIC PANEL +FOIP											
	01 13 49 FACTORY ASBUILT		DATE STARTED 24.01.2013		DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY		INDEX		PLANT NO.		DRAWING NUMBER		SHEET NO.		REV. NO.	
	00 13 04 FOR APPROVAL						RIYADH SAUDI ARABIA		-		C421		CD-323012		SHT 236		CONT. 301	
	REV. NO. DATE DESCRIPTION		OPRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC												01	

1	2	3	4	5	6	7	8	9	10
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A

B

C

D

E

F

REFERENCE	X3 AC CKTS.
211/A3	1
211/B3	2
211/A3	3
211/B3	4
211/B3	5
211/C3	6
211/B3	7
211/C3	8
SPARE	9
SPARE	10

REFERENCE	XSH SPACE HEATER
211/E7	1
211/E7	2
SPARE	3

REFERENCE	XTJ TJ
211/C3	1
211/D3	2
211/D3	3
211/D3	4
SPARE	5

REFERENCE	X6 COMMON ALARM
212/B4	1
212/B5	2
236/E3	3
SPARE	4
SPARE	5

REFERENCE	X4.3 DC CKTS.
216/C3	1
216/C3	2
SPARE	3
SPARE	4
225/D3	5
225/D4	6
225/F3	7
221/F4	8
SPARE	9
SPARE	10
226/D3	11
226/D4	12
226/F3	13
226/F4	14
SPARE	15
SPARE	16
SPARE	17
SPARE	18
SPARE	19
SPARE	20

REFERENCE	X4.4 DC CKTS.
216/D3	1
216/D3	2
SPARE	3
SPARE	4
227/D3	5
227/D4	6
227/F3	7
227/F4	8
SPARE	9
SPARE	10
228/D3	11
228/D4	12
228/F3	13
228/F4	14
SPARE	15
SPARE	16
SPARE	17
SPARE	18
SPARE	19
SPARE	20

REFERENCE	X4.1 DC CKTS.
216/A3	1
216/A3	2
SPARE	3
SPARE	4
221/D3	5
221/D4	6
221/F3	7
221/F4	8
SPARE	9
SPARE	10
222/D3	11
222/D4	12
222/F3	13
222/F4	14
SPARE	15
SPARE	16
SPARE	17
SPARE	18
SPARE	19
SPARE	20

REFERENCE	X4.2 DC CKTS.
216/B3	1
216/B3	2
SPARE	3
SPARE	4
223/D3	5
223/D4	6
223/F3	7
223/F4	8
SPARE	9
SPARE	10
224/D3	11
224/D4	12
224/F3	13
224/F4	14
SPARE	15
SPARE	16
SPARE	17
SPARE	18
SPARE	19
SPARE	20

REFERENCE	X61 COMMON ALARM
212/E4	1
212/E5	2
SPARE	3
SPARE	4
236/E4	5
236/E4	6
236/E5	7
236/E5	8
236/E6	9
236/E6	10
236/E7	11
236/E7	12
SPARE	13
SPARE	14
SPARE	15

AS-BUILT BY \_\_\_\_\_ DATE \_\_\_\_\_ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL
REV. NO.	DATE	DESCRIPTION

DRAWN BY RIZ CHECKED BY KVR  
DATE STARTED 24.01.2013 DATE COMPLETED \_\_\_\_\_  
OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

TERMINAL BLOCKS		
132kV	FIBER OPTIC	PANEL +FOIP
S/S 8709	-	132/13.8KV IN AL-KHARJ CITY
RIYADH		SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء National Grid sa				
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
-	C421	CD-323012	SHT	CONT.
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